CLAIMS

What Is Claimed Is:

1. An electromagnetic wave filter, comprising:

a power medium positioned with respect to a region of space;

a composition disposed within the region of space for forming a plasma;

an energy source electromagnetically coupled to the power medium such that a plasma may be formed in the region of space; and

a control mechanism for selecting and regulating plasma density within the region of space to reflect a first electromagnetic signal frequency emitted from a remote source, while at the same time passing a second electromagnetic signal frequency.

2. An electromagnetic wave filter as in claim 1, wherein the control mechanism includes a power regulator configured to vary energy applied at the power medium.

3. An electromagnetic wave filter as in claim 1, wherein the region of space is within an enclosed chamber defined by substantially non-conductive walls.

4. An electromagnetic wave filter as in claim 3, wherein the control mechanism includes a gas regulator configured to vary the pressure in the enclosed chamber.

5. An electromagnetic wave filter as in claim 3, wherein the enclosed chamber is configured in a shape of a reflector selected from the group consisting of a plane reflector, a curved reflector, and a corner reflector.

6. An electromagnetic wave filter as in claim 5, wherein the curved reflector is parabolic.

7. An electromagnetic wave filter as in claim 3, wherein the plasma fills a portion of the enclosed chamber.

8. An electromagnetic wave filter as in claim 3, wherein the enclosed chamber comprises a dielectric material.

9. An electromagnetic wave filter as in claim 1, wherein the composition is a gas selected from the group consisting of neon, xenon, argon, krypton, hydrogen, helium, mercury vapor, and combinations thereof.

10. An electromagnetic wave filter as in claim 1, wherein the power medium is coupled to the region of space at a plurality of locations.

11. An electromagnetic wave filter as in claim 1, wherein the plasma is formed for continuous electromagnetic wave filtration.

12. An electromagnetic wave filter as in claim 1, wherein the first electromagnetic frequency is an undesired frequency and the second electromagnetic frequency is a desired frequency.

13. An electromagnetic wave filter as in claim 1, wherein the first electromagnetic frequency is a desired frequency and the second electromagnetic frequency is an undesired frequency.

14. An antenna system for receiving an electromagnetic wave, comprising:

an antenna configured for receiving electromagnetic waves; and

a plasma filter associated with the antenna and configured for reflecting a first electromagnetic signal frequency emitted from a remote source, while at the same time passing a second electromagnetic signal frequency, such that either the first electromagnetic signal frequency or the second electromagnetic signal frequency is received by the antenna.

15. An antenna system as in claim 14, wherein the first electromagnetic frequency is an undesired frequency and the second electromagnetic frequency is a desired frequency, thereby causing said desired frequency passing through the plasma filter to be received by the antenna.

16. An antenna system as in claim 14, wherein the first electromagnetic frequency is a desired frequency and the second electromagnetic frequency is an undesired frequency, thereby causing said desired frequency reflecting from the plasma filter to be received by the antenna.

17. An antenna system as in claim 14, wherein the antenna is configured for absorbing a desired electromagnetic frequency, and is further configured for allowing an undesired electromagnetic frequency to pass through.

18. An antenna system as in claim 14, wherein the antenna is a plasma antenna.

19. An antenna system as in claim 18, wherein the plasma antenna comprises:

an enclosed chamber defined by substantially non-conductive walls;

a composition contained within the enclosed chamber capable of forming a plasma;

a power medium positioned with respect to the composition such that when the power medium is energized, a plasma may be formed;

an antenna energy source coupled to the power medium for energizing the power medium and developing a plasma density within the enclosed chamber; and

a signal transmitter or receiver coupled to the plasma.

20. An antenna system as in claim 19, wherein the plasma density is modifiable by an antenna control mechanism.

21. An antenna system as in claim 20, wherein the antenna control mechanism includes a power regulator configured to vary energy applied at the power medium.

22. An antenna system as in claim 20, wherein the antenna control mechanism includes a gas regulator configured to vary the pressure in the enclosed chamber.

23. An antenna system as in claim 14, wherein the plasma filter comprises:

a power medium positioned with respect to a region of space;

a composition disposed within the region of space for forming a plasma; and

an energy source electromagnetically coupled to the power medium such that a plasma may be formed in the region of space.

24. An antenna system as in claim 23, wherein the region of space is within an enclosed chamber defined by substantially non-conductive walls.

25. An antenna system as in claim 23, wherein the plasma density is modifiable by a filter control mechanism.

26. An antenna system as in claim 25, wherein the filter control mechanism includes a power regulator configured to vary energy applied at the power medium.

27. An antenna system as in claim 25, wherein the region of space is within an enclosed chamber and the filter control mechanism includes a gas regulator configured to vary the pressure in the enclosed chamber.

28. An antenna system as in claim 18, wherein the plasma antenna comprises an antenna control mechanism for selecting an antenna plasma density, and wherein the plasma filter comprises a filter control mechanism for selecting a filter plasma density.

29. An antenna system as in claim 28, wherein the antenna control mechanism and the filter control mechanism are electrically coupled together for intercommunication.

30. An antenna system as in claim 14, wherein the electromagnetic wave filter is configured for use with a plurality of antenna elements.

31. An antenna system as in claim 14, wherein a plurality of electromagnetic wave filters are configured for use with the antenna.

32. An antenna system as in claim 14, wherein a plurality of electromagnetic wave filters are configured for use with a plurality of antenna elements.

33. A method for selectively receiving an electromagnetic signal from a remote source, comprising:

identifying a desired electromagnetic frequency to be received from at least one remote source emitting multiple electromagnetic frequencies, including the desired electromagnetic frequency and at least one undesired electromagnetic frequency;

generating a plasma that reflects a first electromagnetic frequency emitted from the remote source, while at the same time passing a second electromagnetic frequency, either the first electromagnetic frequency or the second electromagnetic frequency being the desired electromagnetic frequency; and

positioning an antenna with respect to the plasma such that the desired electromagnetic frequency is received by the antenna, and the undesired electromagnetic frequency is not substantially received by the antenna.

34. A method as in claim 33, wherein the first electromagnetic frequency is the desired electromagnetic frequency.

35. A method as in claim 33, wherein the second electromagnetic frequency is the desired electromagnetic frequency.

36. A method as in claim 33, wherein the first electromagnetic frequency is a range of electromagnetic frequency.

37. A method as in claim 33, wherein the second electromagnetic frequency is a range of electromagnetic frequency.

38. A method as in claim 33, further comprising the step of phase shifting the first electromagnetic frequency upon interaction with the plasma.

39. A method as in claim 33, further comprising the step of phase shifting the second electromagnetic frequency upon interaction with the plasma.

40. A method as in claim 33, where in the antenna is a plasma antenna.

Thorpe, North & Western
8180 South 700 East, Suite #200
Sandy, UT 84070
(801) 566-6633